WHAT IS CLAIMED IS

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    1. A method of generating a free-form surface model, comprising the steps of:

    applying linear transformation to a lattice polygon model to generate vertices of a free-form

10   surface model corresponding to respective vertices of the lattice polygon model; and

    generating control points of cubic Bezier curves that connect the vertices of the free-form surface model, and that correspond to respective edges

15   of the lattice polygon model.

20   2. The method as claimed in claim 1, further comprising a step of interpolating Gregory patches into a mesh comprised of the cubic Bezier curves.

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3. The method as claimed in claim 1, further comprising a step of adding rounding information to the lattice polygon model, the rounding information controlling how round the free-form surface model is

5 when the free-form surface model is generated from the lattice polygon model and the rounding information, wherein said step of applying linear transformation includes a step of generating the vertices of the free-form surface model by utilizing the rounding information.

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4. The method as claimed in claim 3, wherein

15 said rounding information includes rounding information attached to the vertices and the edges of the lattice polygon model.

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5. The method as claimed in claim 1, further comprising a step of reconstructing the lattice polygon model from the free-form surface model by utilizing an

25 inverse transformation of the linear transformation.

6. A computer-readable memory medium having a program embodied therein for causing a computer to generate a free-form surface model, said program comprising program code units configured to perform the steps of:

applying linear transformation to a lattice polygon model to generate vertices of a free-form surface model corresponding to respective vertices of the lattice polygon model; and

generating control points of cubic Bezier curves that connect the vertices of the free-form surface model, and that correspond to respective edges of the lattice polygon model.

7. The computer-readable memory medium as claimed in claim 6, further comprising a step of interpolating Gregory patches into a mesh comprised of the cubic Bezier curves.

8. The computer-readable memory medium as claimed in claim 6, further comprising a step of adding rounding information to the lattice polygon model, the rounding information controlling how round the free-form

5   surface model is when the free-form surface model is generated from the lattice polygon model and the rounding information, wherein said step of applying linear transformation includes a step of generating the vertices of the free-form surface model by utilizing the

10 rounding information.

15 9. The computer-readable memory medium as claimed in claim 8, wherein said rounding information includes rounding information attached to the vertices and the edges of the lattice polygon model.

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10. The computer-readable memory medium as claimed in claim 6, further comprising a step of

25 reconstructing the lattice polygon model from the free-

form surface model by utilizing an inverse transformation of the linear transformation.

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11. A method of transmitting 3D data via a network, comprising the steps of:

adding rounding information to a lattice
10 polygon model, the rounding information controlling how round a free-form surface model is when the free-form surface model is generated from the lattice polygon model and the rounding information by applying linear transformation to the lattice polygon model to generate
15 vertices of the free-form surface model corresponding to respective vertices of the lattice polygon model, and generating control points of cubic Bezier curves that connect the vertices of the free-form surface model, and that correspond to respective edges of the lattice
20 polygon model; and

transmitting the lattice polygon model and the rounding information over the network.

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12.   A method of generating a free-form surface model, comprising the steps of:

receiving a lattice polygon model and rounding
5   information via a network;

applying linear transformation to the lattice polygon model to generate vertices of a free-form surface model corresponding to respective vertices of the lattice polygon model; and

10   generating control points of cubic Bezier curves that serve as edges to connect the vertices of the free-form surface model, and that correspond to respective edges of the lattice polygon model, wherein the rounding information controls how close the vertices
15   and edges of the free-form surface model are to the respective vertices and edges of the lattice polygon model.

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13. A server device for transmitting 3D data via a network, configured to add rounding information to a lattice polygon model, the rounding information
25   controlling how round a free-form surface model is when

the free-form surface model is generated from the

lattice polygon model and the rounding information by

applying linear transformation to the lattice polygon

model to generate vertices of the free-form surface

5   model corresponding to respective vertices of the

lattice polygon model, and generating control points of

cubic Bezier curves that connect the vertices of the

free-form surface model, and that correspond to

respective edges of the lattice polygon model; and to

10 transmit the lattice polygon model and the rounding

information over the network.

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14.   A client device connected to a network,

configured to receive a lattice polygon model and

rounding information via the network; to apply linear

transformation to the lattice polygon model to generate

20 vertices of a free-form surface model corresponding to

respective vertices of the lattice polygon model; and to

generate control points of cubic Bezier curves that

serve as edges to connect the vertices of the free-form

surface model, and that correspond to respective edges

25 of the lattice polygon model, wherein the rounding

information controls how close the vertices and edges of the free-form surface model are to the respective vertices and edges of the lattice polygon model.

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